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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,091	03/11/2004	Richard Alan Dayan	RPS9 2003 0208 US1	6065

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EXAMINER	
PATEL, HETUL B	
ART UNIT	**PAPER NUMBER**
2186	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/798,091	DAYAN ET AL.	
	Examiner	Art Unit	
	Hetul Patel	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the communication filed on 12/19/2006. Claim 8 is amended; and none of the claims are cancelled or newly added. Therefore, claims 1-20 are currently pending in this application.

2. Applicant's arguments filed on 12/19/2006 have been fully considered but they are not persuasive.

3. The rejection of claims 1-20 as in the previous office action is respectfully maintained and reiterated below for Applicant's convenience.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3, 6, 8, 10, 13-15, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coker et al. (USPN: 2003/0149837) hereinafter, Coker in view of Zimmerman et al. (USPN: 2003/0200290) hereinafter, Zimmerman.

As per claims 1 and 3, Coker teaches a method of loading data from disk in a data processing system, comprising: comparing a current sequence of disk requests to data indicative of a previous sequence of disk requests (i.e. comparing the latest read command with the history; see block 216 in Fig. 5); and detecting a match between the

current sequence and the previous sequence (i.e. overlap detected between latest read command and the history; see block 248 in Fig. 5) (e.g. see paragraphs [0046]+, [0067]-[0068] and Fig. 5). However, Coker does not teach about storing a copy of data blocks accessed during the current sequence in a contiguous portion of the disk; and responsive to a subsequent request for data in the disk sequence, mapping the request to the sequential portion of the disk and servicing the request from data in the sequential portion.

Zimmerman, on the other hand, teaches the learning process in which a copy of data is stored sequentially/continuously from the sequence/list of sectors. So in response to the future request for the data in the disk sequence, the data is read from the sequential file stored earlier (e.g. see paragraph [0042] and Fig. 4). Accordingly, it would have been obvious to one of ordinary skills in the art at the time of the current invention was made to implement Zimmerman's teaching in the method taught by Coker. In doing so, the data stored in the sequential file can be read much faster than reading from different sectors, and it will in turn increase the data processing system's drive throughput.

As per claim 6, the combination of Coker and Zimmerman teaches the claimed invention as described above. The further limitation of, the power-on event before the sequence of disk requests, is inherently present in the system taught by the combination of Coker and Zimmerman because the system has to power-on before it can execute any (sequence) of disk request.

As per claims 8, 10, 14 and 17, see arguments with respect to rejection of claims 1 and 3. Claims 8, 10, 14 and 17 are also rejected based on the same rationale as the rejection of claims 1 and 3.

As per claim 15, see arguments with respect to rejection of claim 6. Claim 15 is also rejected based on the same rationale as the rejection of claim 6.

As per claims 13 and 20, the combination of Coker and Zimmerman teaches the claimed invention as described above and furthermore, Coker teaches about updating the data in both the original data block and the copied data block in response to a modification of data in the boot sequence (e.g. see paragraph [0044]).

5. Claims 2, 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coker in view of Zimmerman, further in view of Hung (USPN: 5,247,653).

As per claim 2, the combination of Coker and Zimmerman teaches the claimed invention as described above and furthermore, Coker teaches about storing the data access requests to detect the data access patterns (e.g. see paragraph [0002]). However, both of them failed to teach the further limitation of recording the disk address of each block accessed and the length of each block. Hung, however, discloses about recording the starting address of the block and the length of the block of each memory instruction so once the controller receives the read instruction, the controller can signal the disk drive to retrieve the required number of blocks of data beginning at the starting address (e.g. see Col. 1, lines 30-44). Accordingly, it would have been obvious to one of ordinary skills in the art at the time of the current invention was made to implement

Hung's teaching in the method taught by the combination of Coker and Zimmerman. In doing so, the storage system performance improves since the number of times the controller must go to disk to access the data is reduced. Therefore, the data latency is reduced.

As per claims 9 and 16, see arguments with respect to rejection of claim 2. Claims 9 and 16 are also rejected based on the same rationale as the rejection of claim 2.

6. Claims 4-5, 12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coker in view of Zimmerman, further in view of Lee et al. (USPN: 2004/0260909) hereinafter, Lee.

As per claim 4, the combination of Coker and Zimmerman teaches the claimed invention as described above. However, none of them teaches about prefetching additional data and caching it in the buffer. Lee, on the other hand, teaches that upon detection of a stride, the future memory request can be predicted. The memory sequencer then prefetching the requests to read the additional data and stores/caches them into the prefetch buffer (e.g. see paragraph [0022] and Fig. 2). Accordingly, it would have been obvious to one of ordinary skills in the art at the time of the current invention was made to implement the step of prefetching and caching taught by Lee in the method taught by the combination of Coker and Zimmerman. In doing so, the data will be available for processor to access from the cache instead of the disk drive. Therefore, the data latency is reduced.

As per claim 5, the combination of Coker, Zimmerman and Lee teaches the claimed invention as described above. The further limitation of, determining whether the requested data resides in the buffer and, if so, retrieving the data from the buffering without accessing the hard disk, is inherently embedded in the system taught by Lee.

As per claims 12 and 19, see arguments with respect to rejection of claim 5. Claims 12 and 19 are also rejected based on the same rationale as the rejection of claim 5.

7. Claims 7, 11 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coker in view of Zimmerman, further in view of Brady et al. (USPN: 5,758,050) hereinafter, Brady.

As per claim 7, the combination of Coker and Zimmerman teaches the claimed invention as described above. However, none of them discloses that the contiguous portion of the disk to which the data is copied is on a different partition of the disk than a disk partition on which the original data is stored. Brady, however, teaches about storing/copying data on different partition having different operating characteristics (e.g. see Col. 2, lines 28-37). Accordingly, it would have been obvious to one of ordinary skills in the art at the time of the current invention was made to implement the step of prefetching and caching taught by Brady in the method taught by the combination of Coker and Zimmerman. In doing so, it will provide flexibility in data management.

As per claims 11 and 18, see arguments with respect to rejection of claim 7. Claims 11 and 18 are also rejected based on the same rationale as the rejection of claim 7.

Remarks

8. As to the remark, Applicant asserted:

(a) Coker neither discloses nor suggests comparing a current sequence of disk requests to data indicative of a previous sequence of disk requests or detecting a match between the current sequence and the previous sequence.

(b) Zimmerman neither discloses nor suggests storing a copy of data blocks accessed during the current sequence in a contiguous portion of the disk or responsive to a subsequent request for the data in the disk sequence, mapping the request to the sequential portion of the disk and servicing the request from data in the sequential portion.

Examiner respectfully traverses Applicant's remark for the following reasons:

With respect to (a), Examiner would like to point out to Applicant that Coker does teach about comparing the current disk requests with the previous ones and detecting a match between them in Fig. 5 (e.g. see paragraphs [0046]+, [0067]-[0068] and Fig. 5). The incorrect paragraph(s) and figures were cited in the previous office action due to typographical error. It is corrected in this office action and as a result of that, this office action is made non-final.

With respect to (b), Zimmerman does teach the learning process in which a copy of data (blocks) is stored sequentially/continuously from the sequence/list of sectors. So in response to the future request for the data in the disk sequence (i.e. mapping the request to the sequential portion of the disk and servicing the request from data in the sequential portion), the data is read from the sequential file stored earlier (e.g. see paragraph [0042] and Fig. 4). Accordingly, it would have been obvious to one of ordinary skills in the art at the time of the current invention was made to implement Zimmerman's teaching in the method taught by Coker. In doing so, the data stored in the sequential file can be read much faster than reading from different sectors, and it will in turn increase the data processing system's drive throughput.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hetul Patel whose telephone number is 571-272-4184. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

H.B.Patel 01/31/2007
Hetul Patel
Patent Examiner
Art Unit 2186